



Space Shuttle Program Status

John Casper Associate Manager Space Shuttle Program

September 13, 2010
NAC Space Operations Committee



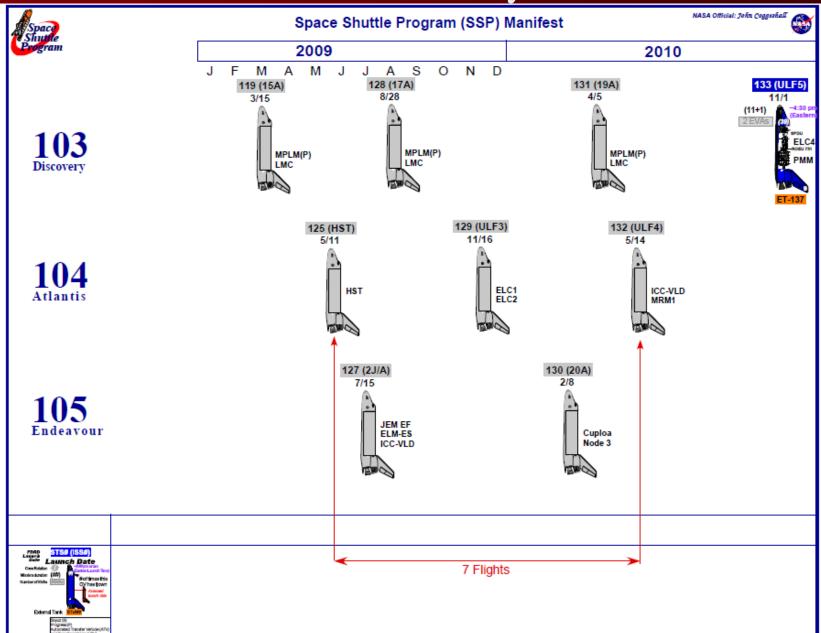


Operations

1

Flown Manifest March 2009 – May 2010





STS-132 (Last Mission)

"By the numbers"



Atlantis completed its 32nd and final planned mission May 26, 2010

	Atlantis con	ipieted its 32 ¹¹⁴ and final planned mission May 26, 20
•	132 nd	Space Shuttle mission
•	32 nd	Flight of Atlantis (120,650,907 statute miles)
•	294	Total days Atlantis has spent in space on 32 missions
•	34 th	Shuttle / International Space Station (ISS) assembly mission
•	1:20:08 am	Launched Friday, May 14 (97th day launch out of 132 missions)
•	7:48:11 am	Landed Wednesday, May 26
•	4,879,978	Statute miles traveled (total Space Shuttle miles - 524,493,743)
•	186	Orbits (4,648 total on 32 missions)
•	75 th	Landing at KSC (58th day - 17 night) & 130th overall (54 EDW & 1 WSSH)
•	194	Different "visitors" to the ISS representing 15 countries
•	830	Space Shuttle seats filled (individual total is 356 – Naoko Yamazaki was last)
•	28,792	Pounds of hardware transferred to the ISS – includes cargo carrier (inside & out)
•	17,670	MRM1 – "Rassvet" – loaded (empty weight is 11,188 pounds)
•	7,532	Integrated Cargo Carrier with supplies to the ISS
•	6,466	Integrated Cargo Carrier with supplies from the ISS
•	1,325	Pounds of water transferred to the ISS
•	2,192	Pounds of middeck items delivered to the ISS aboard Atlantis
•	1,763	Pounds of middeck items returned from the ISS aboard Atlantis
•	8,229	Total hardware return aboard Atlantis – includes cargo carrier (inside & out)
•	816,349	Mass in space of the ISS (in pounds)
•	98	Percentage complete of ISS assembly (pressurized volume)
•	3	Spacewalks completed totaling 21 hrs, 20 min. (breakdown below)
•	914:53	Total hours & minutes of EVA time devoted to ISS assembly
•	146	Total number of EVA's devoted to ISS assembly

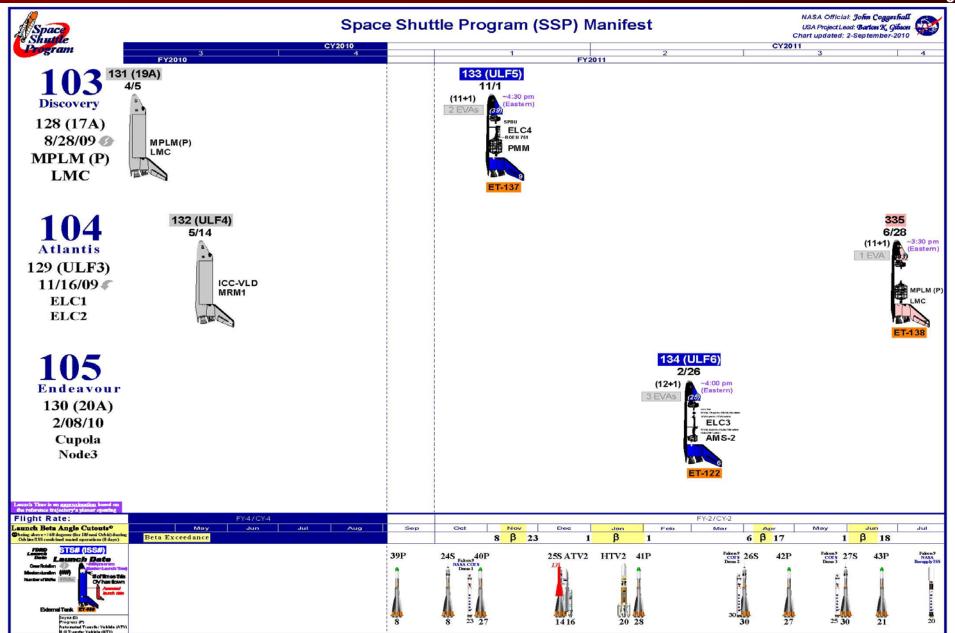
Total number of EVA's performed by U.S. astronauts

239



Planning Manifest as of September 2, 2010





November Mission STS-133



Launch Target:

4:40 p.m., EDT - Nov. 1, 2010

Orbiter:

Discovery

Mission Number:

STS-133 (133rd Space Shuttle flight)

Launch Window:

10 minutes

Launch Pad:

39A

Mission Duration:

11 days

Landing Site:

KSC

Inclination/Altitude:

51.6 degrees/122 nautical mi

Primary Payload:

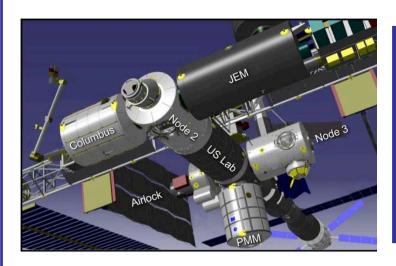
35th ISS flight (ULF5), EXPRESS Logistics Carrier 4 (ELC4), Permanent Multi-Purpose Module (PMM)



STS-133 Crew

Left to right

Alvin Drew Nicole Stott Eric Boe, Pilot Steve Lindsey, Commander Michael Barratt Tim Kopra



- 35th Space Shuttle mission to the ISS.
- Permanent
 Multipurpose Module,
 the Express Logistics
 Carrier 4.
- Provided critical spare components to the ISS.

Upcoming Mission STS-134



Launch Target:

4:04 p.m., EST - Feb. 26, 2011

Orbiter:

Endeavour

Mission Number:

STS-134 (134th Space Shuttle flight)

Launch Window:

10 minutes

Launch Pad:

39A

Mission Duration:

10 days

Landing Site:

KSC

Inclination/Altitude:

51.6 degrees/122 nautical mi

Primary Payload:

36th ISS flight (ULF6), EXPRESS Logistics Carrier 3 (ELC3), Alpha Magnetic Spectrometer (AMS)



STS-134 Crew

(Clockwise starting bottom center)

Mark Kelly, Commander Gregory H. Johnson, Pilot Michael Fincke Greg Chamitoff Andrew Feustel Roberto Vittori, European Space Agency



AMS

- 36th Space Shuttle mission to the ISS.
- Endeavour will deliver the AMS plus spare parts including two S-band communications antennas.
- High-pressure gas tank, additional spare parts for Dextre, and micrometeoroid debris shields





Transition





Michoud Assembly Fac.

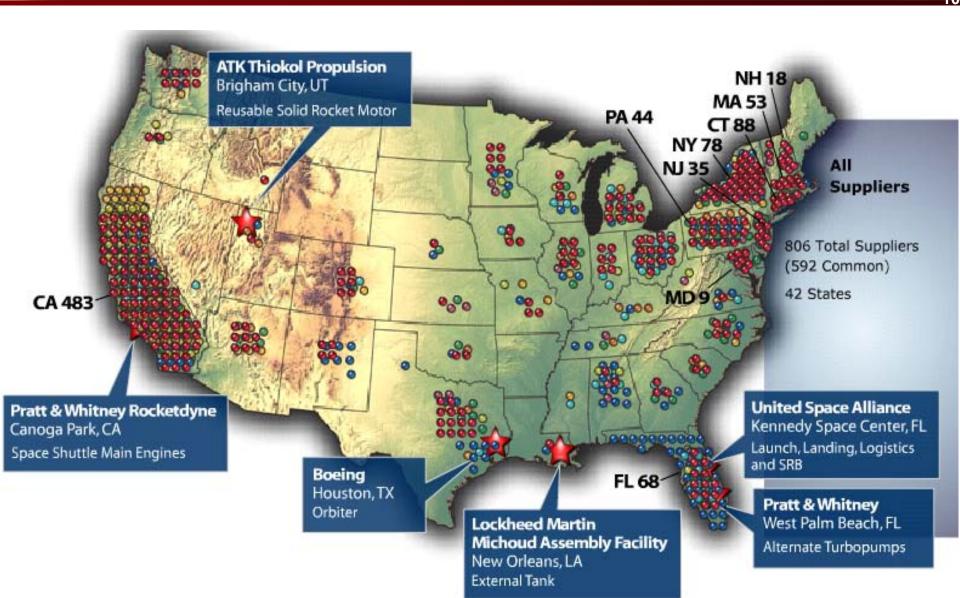
New Orleans, LA

(FSW, FCE, ORB, RMS)

-United Space Alliance - SFOC

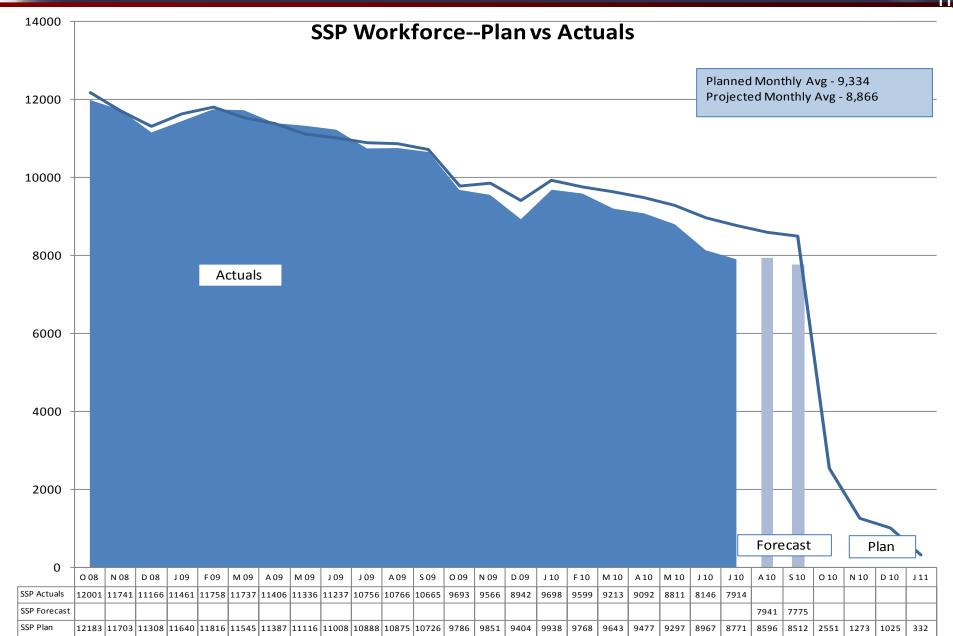
Space Shuttle Program Major Suppliers





Space Shuttle Contractor Workforce





SSP T&R is funded through FY 2012 with an aggressive but achievable plan

- ➤ Baseline plan will complete the manifest by February 2011. Some activities currently planned for FY 2011 will be re-phased into FY 2012 for operations continuing beyond February 2011
- Assumes most major activities will be completed by the end of FY 2012
- Due to the change in the manifest, there may still be residual work that remains after FY 2012 and will be implemented using Agency resources
- Constellation (Cx) transition results in additional T&R costs; SOMD assumes these costs will be covered as a threat to Cx Transition

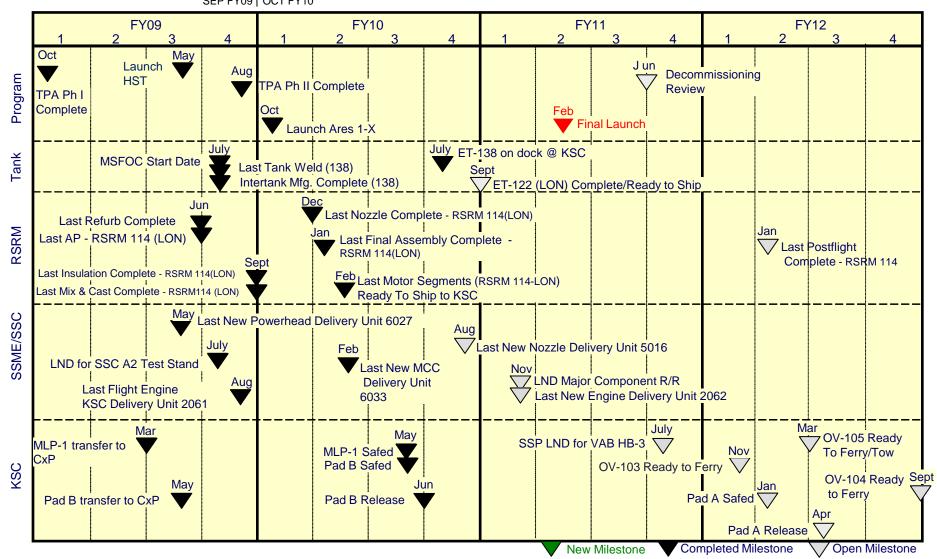
Basis of Plan/Key Assumptions:

- Orbiters to be safed and ready for transport by the end of FY 2012
- All hazardous commodities secured and personal property decontaminated
- Historic artifacts identified and screened with museums/educational institutions for placement
- Non-artifact personal property at government facilities along with duplicate records at Centers/ Government Owned Contractor Operated (GOCO) facilities are dispositioned in place as Agency resources allow
- Personal property is excessed from facilities identified for demolition and vacated leased facilities
- Records retention policy implemented
- Current plan requires no waivers or deviations to U. S. Code of Federal Regulations

Space Shuttle T&R Major Transition Milestones







Personal Property

- ➤ Nearly 1.1 million line items of property reviewed. Approximately 42% of total (mostly RSRM/SRB) was to be transferred to CxP for future program use
- ➤ Utilizing General Services Administration (GSA) for property and artifact prescreening, with pre-screening site going active in September 2009. Unneeded property to be sold through GSAXcess under a dedicated Space Shuttle portal
- Second Orbiter Request for Information (RFI) closed in February 2010. Administrator announcement of final disposition locations pending additional clarification of NASA authorization bills and discussions with National Air and Space Museum (NASM) regarding placement of Orbital Vehicle (OV)-103 Discovery and OV-100 Enterprise
- ➤ Property disposition burndown plans assume planned access to workforce and facilities during T&R period in FY 2011 and FY 2012

Real Property

- ➤ Kennedy Space Center (KSC) major facility transfers in work to support 21st Century Launch Complex and future Agency programmatic use.
- ➤ Michoud Assembly Facility (MAF) to be maintained at a Customer Tenant Ready (CTR) level through FY 2011 while future Agency requirements are determined. continues toward completion



Supporting Our Workforce

From the beginning, there has been a close partnership between the Program, Agency, and Centers; Projects and Contractors; and local and state agencies. We have focused on:

- Collaboration
- Best practices and lessons learned
- Updates from the Agency

Some of Our Tools



- Increased <u>Communication</u> to Employees
- Ask for <u>Feedback</u>
- Implemented Retention/Enhanced Severance
 - Monetary Plans Unique to company and area
- <u>Celebrate</u> and Honor Employee Contributions
- Provide <u>Training</u> and Assistance
- Monitor how we are doing



Palmdale Facility – Aerial View (1996)



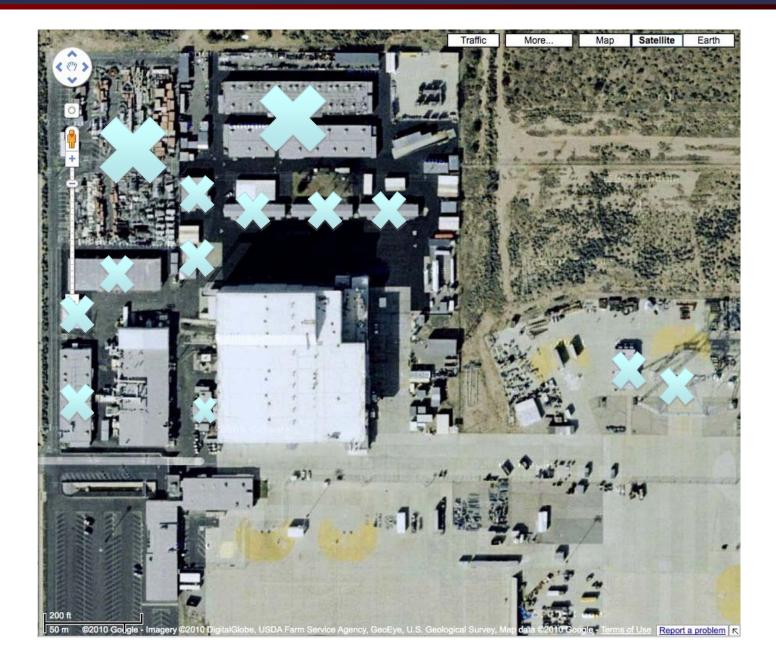






Palmdale Aerial – After T&R Completed

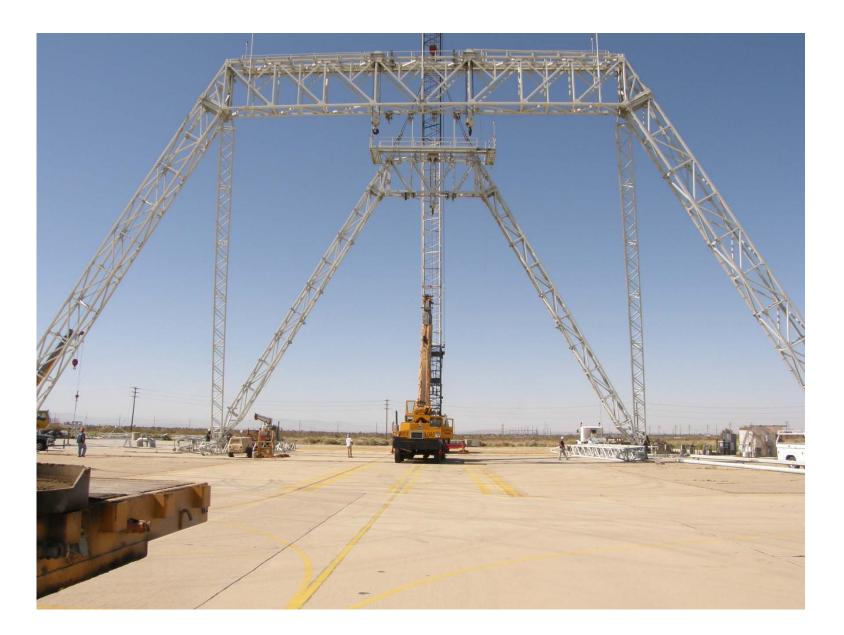






Palmdale Orbiter Lifting Facility – Before





Palmdale Orbiter Lifting Facility – Demolition In Work





Trailers/Office Buildings







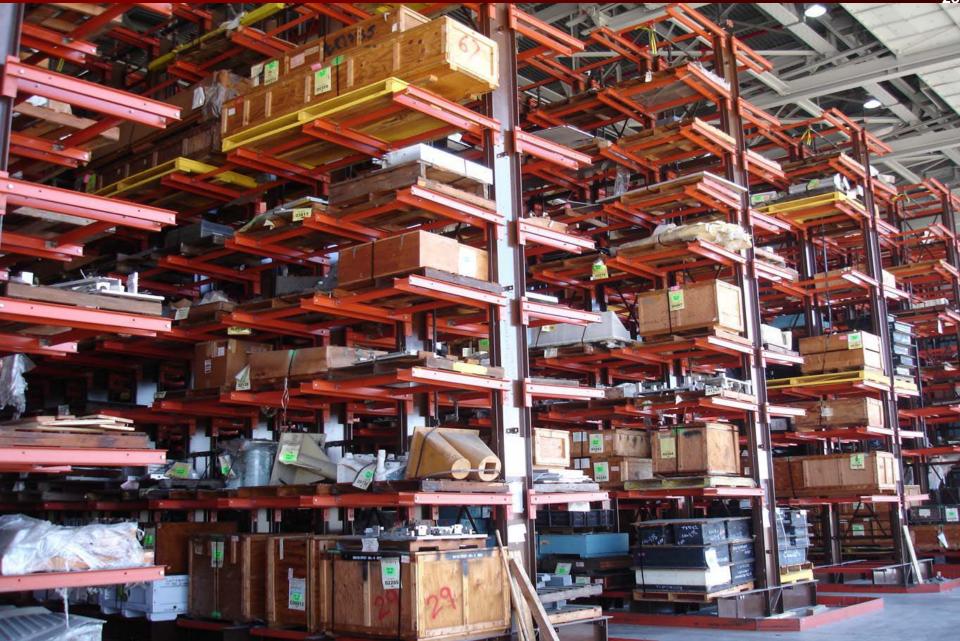
Orbiter Work Platforms from Maintenance Bays – Demolition





MAF Parts Storage Warehouse - Before





MAF Parts Storage Warehouse - After







MAF Processing Building - Before



MAF Processing Building - After

MAF Tooling in Temp Storage









LM (RCC Vendor in Dallas) - Wing Final Assembly Fixture:



The Wing Final Assembly Fixture has had all Removable Tooling and Equipment Removed. What remains is for the Demolition Contractor.





LM (RCC vendor in Dallas) Lay-Up Room:



The Lay-Up Room has had everything that can be removed except for items that are attached to the Electrical, Vacuum, or Air Systems. What remains is for the Demolition Contractor.





LM RCC Vendor - Equipment, Stores & Tooling Racks:



All Racks Are Empty.



Overall Program Summary

- #1 goal is to fly the remaining missions safely and successfully
- Top Program Risks are identified and worked as a high priority
 - Retention of critical skills is a major program emphasis
- Program resources are allocated to mitigate, control, and reduce Top Program Risks
- T&R issues have been worked for several years by all managers
 - T&R transfers to new organization several months before last flight

BACKUP

NASA

Increased communication to Employees

- Newsletters—print and electronic
 (Rendezvous, Company newsletters)
- Websites—Centers and Companies
- All-hands, Supervisory Meetings (all levels of management)
- Supervisor Talking Points
- Rumor Busters
- Center/Contractors notes/letters to employees
- Blogs

Ask for Feedback



- Annual Employee Surveys
- Feedback and Brainstorming Sessions
- Focus Groups
- Supervisor Confidence Survey (every 6 months)
- Rumor-busters and Fact or Fiction
- "Contact Us" options on websites
- Management By Walking Around

Celebrate and Honor Employee Contributions



The Agency, Contractors, Centers, and Program are planning ways to celebrate and honor the contributions of the Space Shuttle Team Members. These include:

- Celebrations—pride events, dinner for employees, open house/family events
- Mementos—plaques, Payload Bay Liner Cards, certificates
- Rendezvous articles highlighting employees and/or milestones
- Space Shuttle Senior Managers visits
- "Unsung Heroes" videos and interview with employees, vendors and suppliers
- Space Shuttle Program Legacy Video
- Space Shuttle Program Manager's Wall of Fame
- Space Shuttle Program Office
 - Awards, certificates, flown mementos, custom bookmarks
 - Patch Design Contest, Face in Space website, Wake-up song contest

Provide Training and Assistance



- Love'em or Lose'em
- Transition/Change Management
- Communication
- Retreats

For Employees

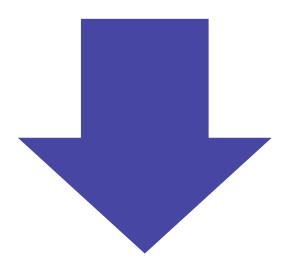
- Focus on Career Development and Skills Assessment
- EAP Assistance Stress Management
- Transition/Change Management
- Partnerships Centers/Companies and Workforce Boards
 - Transition Centers on and off-site
 - Job Fairs (Virtual and In person)
 - Retraining Opportunities
 - Job Skill Training resume writing, interviewing skills, etc
 - Resource Fairs financial planning, Social Security Administration, etc.

Monitor How We Are Doing



- Track Attrition Meet twice yearly with prime contractors to assess and discuss best practices
- Monitor critical skills and assess "bench strength"
 - Contractor AOEs are to track critical skills, develop contingency plans, and keep up employee morale
- Supervisor Confidence Survey (every 6 months)
- **Check Morale**
 - Management By Walking Around
 - Feedback and Brainstorming Sessions
 - Employee Surveys

What is impacting morale...

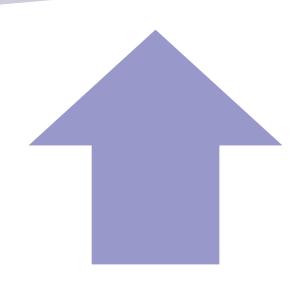


Negatives

- · Emotional impacts of end of Program
- · Loss of key contactor employees
- Concern about future work good jobs gone, not enough to do, interesting work outside the Agency
- Uncertainty of future mission of the Agency

Positives

- Meaningful Work in the Shuttle Program
- Commitment to SSP and NASA
- Ability to make a difference in SSP
- Assurances by NASA about interesting future work



NASA

Confidence to support the SSP through the end of the Program

Supervisory Survey

Survey Date	Civil Servant			Contractor		
	Green %	Yellow %	Red %	Green %	Yellow %	Red %
August 2008	64	32	4	43	40	14
February 2009	55	39	4	42	47	3
December 2009	71	24	4	46	46	4
May 2010	90	7	1	55	31	4

I am likely to stay with SSP through program retirement.

Employee Survey

•	SD	Disagree	NA/D	Agree	SA
2006	7.5%	10.7%	16.1%	34.5%	31.2%
2007	7.2%	7.1%	18.3%	37%	29.5%
2008	2.5%	4.8%	16.8%	38.0%	33.7%
2009	1.2%	3.0%	11.6%	35.2%	47.9%
2010	2.1%	3.0%	12.9%	29.9%	50.1%

Current search for jobs outside the SSP

68% aren't looking right now (69.2 % '09); 8.8% are actively looking (5% in '09 and 10.8% in '06)

Worried about type of work available after Shuttle work ends.

SA/A: 2006 (36.4%) 2007(42.7%) 2008(45.2%) 2009(52.5%) 2010 (62.5%)